



1970 President Richard Nixon signs the National Environmental Policy Act, requiring an environmental impact statement for all major federal actions. The Clean Air Act is amended, creating stringent anti-pollution laws, setting auto

CLEAN AIR

The quality of the air we breathe directly affects our health and well-being. Air pollution is a factor in heart and lung disease, as well as in increased cancer risk. It also harms crops and buildings, reduces visibility, and impacts soil, lakes and streams, and the food web that sustains all life.

Air quality is one of the most obvious examples of the progress we've made since 1970. Thirty years ago, cars emitted 10 times the pollutants they emit today. Factories and power plants released thousands of tons of emissions directly into the air, unchecked and uncontrolled. In the past, Region 8's two biggest cities -- Denver and Salt Lake City -- routinely violated one or more national air quality standards. In 1972, Denver violated the short-term carbon monoxide (CO) standard on 125 days.

The 1970 Clean Air Act introduced tough new rules to control air pollution. Since 1970, we have removed 98% of lead from the air, 79% of soot, 41% of sulfur dioxide, 28% of CO and 25% of the "smog soup" known as ozone. Still, industrial and economic growth have continued. Nationally, from 1970 to 1997, the U.S. population grew 31%, Gross Domestic Product rose 130%, and total vehicle miles traveled jumped 127%.

In the 1970s, Denver air exceeded federal limits for CO virtually every day during the high-pollution winter season. Air quality measures such as controls on industrial sources, cleaner-burning cars, a vehicle inspection and maintenance program, and oxygenated

fuels have achieved impressive results. From 1996-1999, Denver exceeded federal CO standards only once.

Progress Controlling "Criteria" Air Pollutants

EPA's efforts to reduce air pollution begin with six criteria pollutants identified in the Clean Air Act: Ozone (O₃), nitrogen dioxide (NO₂), particulate matter (PM), sulfur dioxide (SO₂), carbon monoxide (CO), and lead (Pb). For each, EPA has set health-based standards. If local areas exceed these standards, they must take steps to achieve compliance.

Ozone

Ozone, or smog, is a lung irritant formed by the combination of volatile organic compounds (VOCs), oxides of nitrogen and sunlight. Smoggy conditions aggravate asthma, especially among children and the elderly. They can also cause respiratory problems for healthy adults working or exercising outside. Ozone concentrations at Region 8 trend sites dropped 17% between 1988-97. Ozone remains a concern in urbanized areas, particularly along Colorado's Front Range and Utah's Wasatch Front.

Carbon monoxide

Concentrations of CO, a colorless, odorless gas resulting mostly from vehicle exhaust, dropped 46% between 1988-1997 at Region 8 trend sites. Over time, dramatic progress has been made in Salt Lake City and Denver. Colorado's Front Range is now approaching redesignation as a CO attainment area. Successes have



Denver on a "brown cloud" day.

been realized elsewhere also. In Great Falls, Montana, CO concentrations have declined 50% since 1987.

Nitrogen dioxide

NO₂ and nitrogen oxides -- together known as NO_x -- help form the ground-level ozone, or smog, that hangs over cities in the summer. Concentrations of NO₂ decreased 7% at trend sites between 1988-97. NO_x, a powerful lung irritant and a precursor of

acid rain, is especially difficult to control, because it travels easily over great distances.

Particulate matter

Particulate matter is the dirt, smoke and soot in air. PM₁₀, which includes all particles under 10 microns in diameter, dropped 32% at trend sites between 1988-97 in Region 8. Carmakers and industries that have embraced pollution control deserve much of the credit. Some particulate pollution also comes from natural sources like windblown dust or forest fires. Despite progress, PM remains a concern, particularly in areas where inversions trap pollutants for long periods of time.

Sulfur dioxide

SO₂, a major contributor to acid rain, comes from fuel burning and metal smelting. SO₂ at trend sites dropped 44% between 1988-97 in

Region 8, with much of the progress due to controls on coal-fired power plants. Further SO₂ reductions are expected as additional acid rain-control deadlines come due in the next decade. One success story is that of Billings, Montana, which reversed an upward SO₂ trend in the early 1990s by identifying industrial sources and initiating control measures.

Lead

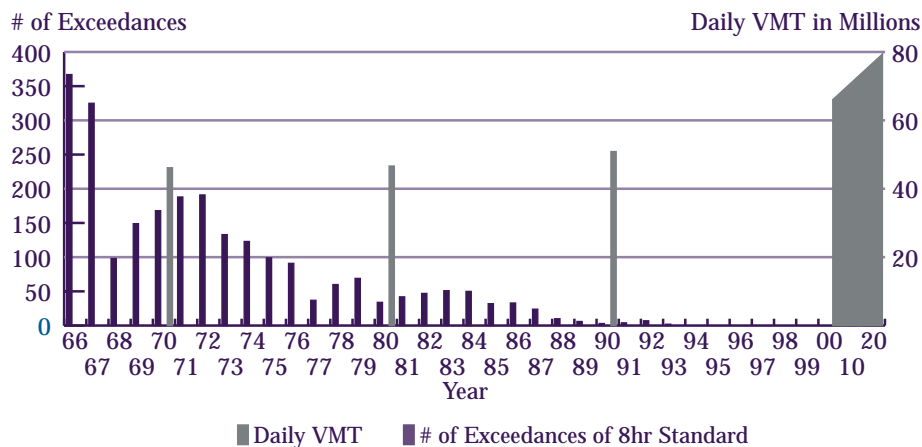
Unleaded gasoline, introduced in 1975, accounts for most of the 67% reduction in lead concentrations at trend sites between 1988-1997. In Region 8, high lead levels are associated mostly with localized industrial activities.

Cleaner Air for the New Century: New Vehicle Emissions Standards

In December 1999, President Clinton announced the strongest standards ever for controlling tailpipe emissions. For the first time, sport utility vehicles, minivans and pickup trucks will have to meet the same standards as passenger cars. This action also calls for cleaner gasoline with less sulfur.

The health benefits of these new standards are significant. Over the next few decades, almost 50 million tons of smog-causing air pollution will be removed from the air nationally. The result means 260,000 fewer asthma attacks in children, 4,300 premature deaths prevented and 173,000 respiratory illnesses avoided. The new rules will also save the nation \$25 billion in medical and other health-related costs.

Carbon Monoxide Exceedances & Vehicle Miles Traveled (VMT) in Denver



In the 1970s, Denver air exceeded federal limits for CO virtually every day during the high-pollution winter season. Air quality measures such as controls on industrial sources, cleaner-burning cars, a vehicle inspection and maintenance program, and oxygenated fuels have achieved impressive results. From 1996-1999, Denver exceeded federal CO standards only once.

New Standards

In 1997, EPA developed new health-based standards for PM₁₀, an additional standard for PM 2.5 (particles under 2.5 microns in diameter), and a revised ozone standard. These new standards are the result of years of scientific analysis indicating that health effects in humans occur at levels lower than existing standards. EPA is pressing in federal court to adopt these standards, which will protect sensitive groups such as children, the elderly and those with respiratory disorders.

Air Toxics

Congress amended the Clean Air Act in 1990, asking EPA to reduce air pollution from a vast group of 188 additional "toxics" -- hazardous pollutants that contribute to cancer, birth defects and neurological disorders. To date, EPA has issued 44 new emissions standards regulating 79 different source categories, such as steel mills, paint factories and dry cleaners. Dozens more industry-specific deadlines will be adopted over the next few years, leading to significant cuts in toxic emissions.



Population growth brings new pressures -- particularly increased vehicle traffic -- on air quality.

Air Pollutant Concentrations Are Declining

Average Concentrations of Criteria Pollutants at R8 Trend Monitoring Sites 1988 vs.1997

Pollutant	# Trend Sites	Standard	1988 Average	1997 Average	Decline
CO	22	8 hr Max. - 9ppm	8ppm	4.3ppm	↓ 46%
PM ₁₀	101	Annual Mean - 50 ug/m ³	28.1 ug/m ³	19.2 ug/m ³	↓ 32%
Ozone	20	1 hr Max. - 0.12ppm	0.098ppm	0.081ppm	↓ 17%
SO ₂	33	Annual Mean - 0.03ppm	0.0064ppm	0.0036ppm	↓ 44%
Lead	7	Max. Avg. - 1.5 ug/m ³	0.9 ug/m ³	0.3 ug/m ³	↓ 67%
NO ₂	17	Annual Mean - 0.053ppm	0.014ppm	0.013ppm	↓ 7%

Monitoring trends are influenced by the distribution and number of monitoring sites in the Region and therefore can be driven largely by urban concentrations. For this reason, they are not indicative of background regional concentrations

ppm = parts per million ug/m³ = micrograms per cubic meter

Since 1970, all six of the "criteria" air pollutants identified in the Clean Air Act have shown improvement. Concentrations of pollutants in the air, measured at various monitors across the Region, have been greatly reduced. This graphic shows progress between 1988 and 1997.

Visibility

Protecting air quality from the types of degradation that reduce visibility is a high priority. Without the effects of pollution, a natural visual range is 140 miles in the West. Fine particles and gases have reduced this range to 33-90 miles. This impairment threatens our enjoyment of Region 8's vistas and vast natural beauty. A new Regional Haze Rule calls for states to set visibility goals in national parks and wilderness areas and develop long-term pollution prevention plans. EPA is also working with states, tribes and federal agencies to improve visibility conditions.

Regional Challenges

Despite progress, clean air improvements are being offset by rapid growth in the sheer number of pollution sources, especially in rapidly growing communities. Population growth brings more

vehicles, industrial activities and fuel burning for heat and electricity. In Denver, for example, vehicle traffic is projected to increase 25% by 2020. These pressures will make maintaining air quality improvements a big challenge.

Improving Air Quality in the Mt. Zirkel Wilderness Area

In the mid 1990s, emissions from coal-fired power plants near Craig and Hayden, Colorado severely impacted visibility in this Class 1 wilderness and contributed to the most acidic snowfall west of the Mississippi. In partnership with EPA, other federal agencies and nonprofits, utility companies committed to controlling emissions. The controls at the Hayden plant for example -- to be fully installed in 2000 -- will cut total annual emissions by 14,000 tons (nearly 85%) and NO_x emissions by 5,000 tons (over 40%).

in Denver, CO. 1971 Congress restricts lead-based paints in residences and bans lead paint on cribs and toys. Manufacturers are required to supply toxicological information and register pesticides. Canada and the U.S.